

Bench Mark: Chiseled "x" on S.E. Abut., Bridge over Deer Creek, 16.53' Rt. Sta. 307+58.41 El. 590.62

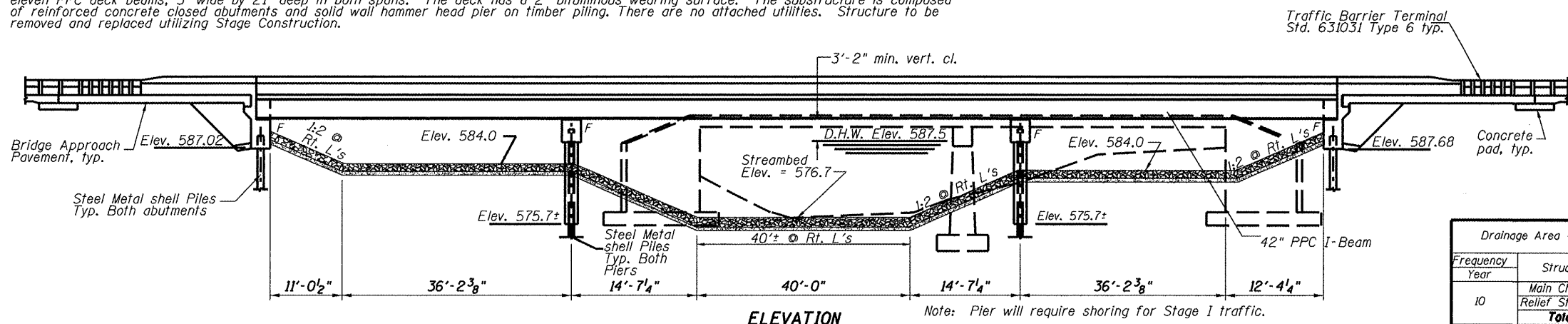
Existing Structure: The existing structure, S.N. 054-0012, was originally constructed in 1930. In 1970 the existing reinforced concrete T-beams were removed and replaced with PPC deck beams and the abutments and piers were widened. In 2000, nine deteriorated deck beams were removed and replaced in kind. Channel excavation and placement of riprap was completed in 2002. The structure is a two span bridge with a back length of 86'-0" along  $\ell$  and an out to out width of 33'-0" constructed with no skew. The superstructure consists of eleven PPC deck beams, 3" wide by 21" deep in both spans. The deck has a 2" bituminous wearing surface. The substructure is composed of reinforced concrete closed abutments and solid wall hammer head pier on timber piling. There are no attached utilities. Structure to be removed and replaced utilizing Stage Construction.

**DESIGN SCOUR ELEVATION TABLE**

DESIGN SCOUR ELEVATION (ft.)	WEST ABUT.	PIER 1	PIER 2	EAST ABUT.
	587	568.8	568.8	587

STATION 306+89.00  
 BUILT 20... BY  
 STATE OF ILLINOIS  
 F.A.P. RT. 717 SEC. 109(B-3)  
 LOADING HL-93  
 STRUCTURE NO. 054-0514

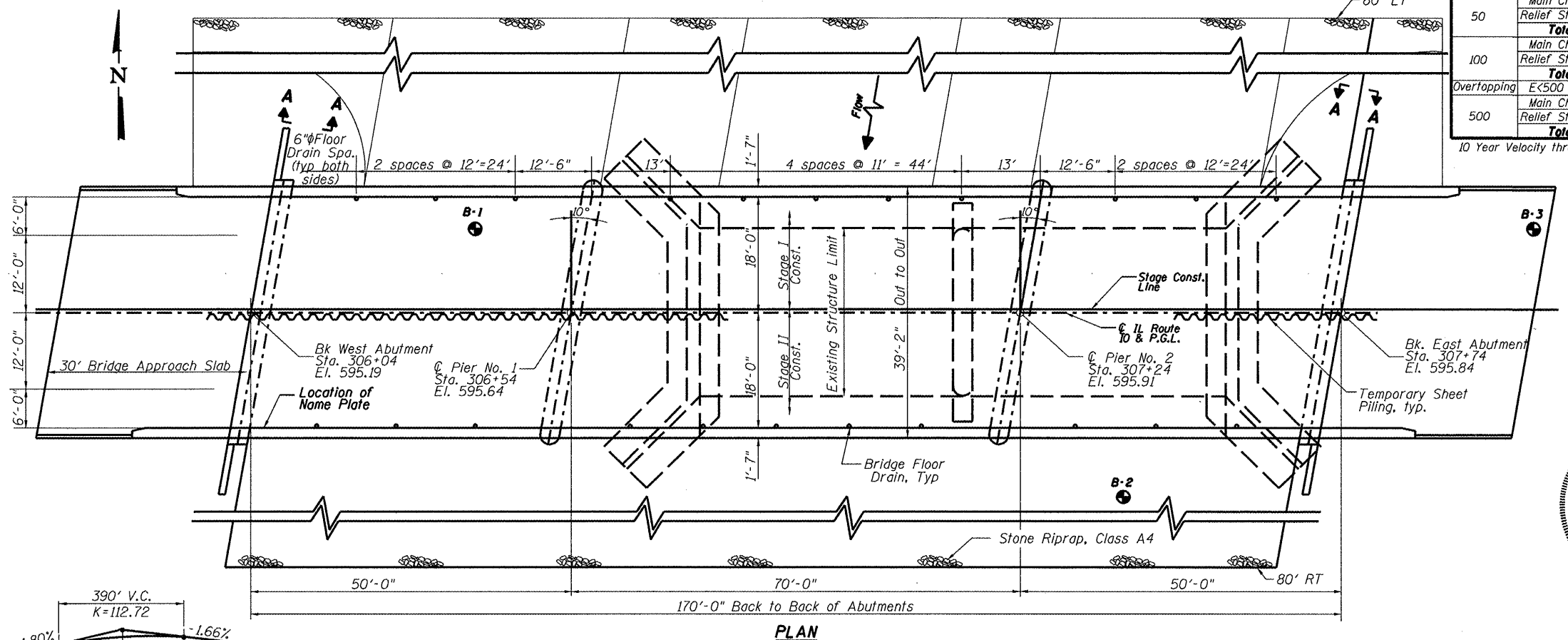
**NAME PLATE**  
 See Std. 515001



**WATERWAY INFORMATION**

Drainage Area =	40.5	mi <sup>2</sup>	Ex. Low Grade Elev.	589.25	ft.	Sta.	271+86.55
			Pr. Low Grade Elev.	589.25	ft.	Sta.	271+86.55
Frequency	Structure	Discharge	C.F.S.	Waterway Opening (ft <sup>2</sup> )	Natural H.W.E.	Created Head (ft.)	Headwater Elev.
Year		Existing	Proposed	Existing	Proposed	Existing	Proposed
10	Main Channel	2,775	2,853	430	812	587.0	2.3
	Relief Structure	575	497	57	57	587.0	2.4
	<b>Total</b>	<b>3,350</b>	<b>3,350</b>	<b>487</b>	<b>869</b>	...	...
50	Main Channel	4,213	4,944	467	897	587.5	2.3
	Relief Structure	629	508	66	66	587.5	2.3
	<b>Total</b>	<b>4,842</b>	<b>5,452</b>	<b>533</b>	<b>963</b>	...	...
100	Main Channel	4,383	4,760	480	925	587.7	2.4
	Relief Structure	679	549	69	69	587.7	2.3
	<b>Total</b>	<b>5,062</b>	<b>5,309</b>	<b>549</b>	<b>994</b>	...	...
Overtopping							
	E < 500 Yr.	Box P < 50 Yr.	Box P < 500 Yr.				
500	Main Channel	5,235	5,197	692	991	588.2	2.3
	Relief Structure	680	375	76	76	588.2	2.3
	<b>Total</b>	<b>5,915</b>	<b>5,572</b>	<b>768</b>	<b>1,067</b>	...	...

10 Year Velocity through Existing Bridge = 4.92 fps  
 10 Year Velocity through Proposed Bridge = 3.09 fps



**APPROVED**  
 For Structural Adequacy Only

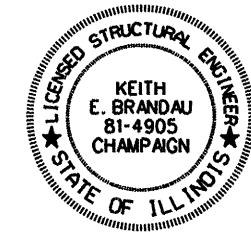
*Ralph E. Anderson (TSD)*  
 Engineer of Bridges & Structures

**LOADING HL-93**

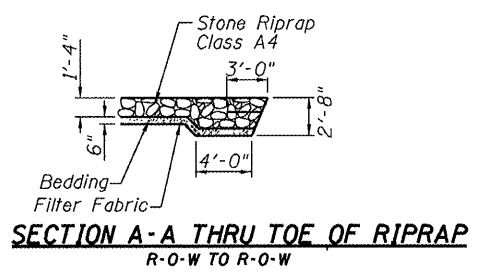
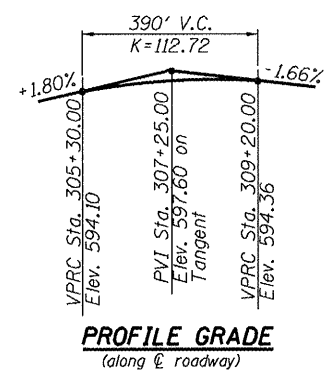
Allow 50#/sq. ft. for future wearing surface.

**DESIGN SPECIFICATIONS**

2007 AASHTO LRFD Bridge Design Specifications with 2008 Interims



*Keith E. Brandau 11/4/09*  
 KEITH E. BRANDAU  
 LICENSED STRUCTURAL ENGINEER NO. 081-4905  
 LICENSE EXPIRES 11/30/10

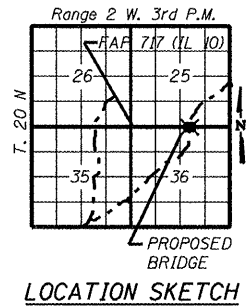


**DESIGN STRESSES**

- FIELD UNITS**  
 $f_c = 3,500$  psi (Concrete)  
 $f_y = 60,000$  psi (Reinforcement)
- PRECAST PRESTRESSED UNITS**  
 $f_c = 6,000$  psi  
 $f_{ci} = 5,000$  psi  
 $f_s = 270,000$  psi (1/2"  $\phi$  low lax. strands)  
 $f_{si} = 201,960$  psi (1/2"  $\phi$  low lax. strands)

**SEISMIC DATA**

Seismic Performance Category (SP2) = 1  
 Design Spectral Acceleration at 1.0 sec. ( $S_{D1}$ ) = 0.10g  
 Design Spectral Acceleration at 0.2 sec. ( $S_{D5}$ ) = 0.17g  
 Soil Site Class = C



**GENERAL PLAN & ELEVATION**  
**IL ROUTE 10 OVER DEER CREEK**  
**F.A.P. ROUTE 717 SECTION 109(B-3)**  
**LOGAN COUNTY STATION 306+89**  
**STRUCTURE NO. 054-0514**

USER NAME:	DESIGNED - RTM	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION			GENERAL PLAN AND ELEVATION			F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
PLOT SCALE:	DRAWN - MSD	REVISED -							717	109B-3	LOGAN	73	36
PLOT DATE:	CHECKED - KEB	REVISED -	SCALE:			SHEET NO. 1 OF 27 SHEETS	STA. TO STA.	FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT	CONTRACT NO. 72A88		
	DATE -	REVISED -	SODEMANN AND ASSOCIATES, INC.								07100		